

Claims (Clean Copy)

What is claimed is:

1. A video camera with enhanced image clarification comprising:

an optical system consisting of a lens and an adaptive optical device which produces an optical image of an object which is being continuously distorted by time-varying aberrations of an optical medium;

an adaptive optic device in said optical system arranged to cancel said aberrations and to produce clarified, in-focus, optical images of said object in the lens' focal plane;

a detector array arranged to receive said in-focus optical images and to produce a sequence of digital in-focus images, namely, $I(k)$, $I(k-1)$, ..., where k is a time index; and

a digital sequential diversity processor which uses the said sequence of digital in-focus images to provide real-time control signals, $T(k)$, $T(k-1)$, ..., for said adaptive optic device to thereby cancel said aberrations.

2. The camera of claim 1 wherein said sequential diversity processor utilizes diversity $D(k-1)$, along with current and previous data images, $I(k)$ and $I(k-1)$, as diverse images to estimate $Q(k-1)$ a residual aberration in said optical system, whereby $D(k) = -Q(k-1)$.

3. The camera of claim 1 wherein said sequential diversity processor adds $T(k-1)$ to $D(k)$ to get the control signal for said adaptive optic device at time k , that is, $T(k) = T(k-1) + D(k)$.

4. The camera of Claim 1 whereby the sequential diversity processor estimates the aberrations distorting the object and calculates control signals for said adaptive optic device to cancel said aberrations; and whereby the imaging system produces solely adapted in-focus images of said object. No other auxiliary equipment or signal, like an intentionally defocused image, is needed to control the adaptive optic device.